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A Duke Energy Company

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-001

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
Request for Exemption Pursuant to 10 CFR 50.12 - Exemption to the Cladding Material Specified in 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K
TAC Nos. MB6907 and MB6908

Reference: Letter from Duke Energy Corporation to NRC, same subject, dated December 3, 2002

In the reference letter, Duke Energy Corporation submitted an exemption request from certain requirements of 10 CFR 50.44, "Standards for Combustible Gas Control in Light-Water-Cooled Power Reactors," 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," and Appendix K of 10 CFR 50, "ECCS Evaluation Models." The exemption requested related solely to the specific types of cladding material specified in these regulations for use in light water reactors. Duke requested an exemption of these requirements to allow up to eight lead test assemblies (LTAs) containing fuel rods, guide thimble tubes, and instrumentation tubes fabricated with a low tin version of ZIRLO™.

The NRC provided a request for additional information concerning this exemption request via a letter dated March 28, 2003. The purpose of this letter is to respond to that request.

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The attachment to this letter contains the NRC request for additional information and Catawba's response to each item.

There are no regulatory commitments contained within this letter.

Inquiries on this matter should be directed to R. D. Hart at (803) 831-3622.

Very truly yours,

G. R. Peterson

Attachment

xc w/attachment:

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ATTACHMENT 1

NRC REQUEST FOR ADDITIONAL INFORMATION AND CATAWBA RESPONSE

(Throughout this attachment, the NRC request for additional information is highlighted in **bold type** and Catawba's response is shown in normal type.)

Attached are questions received by the NRC concerning an exemption request submitted to allow Catawba to use Low Tin (Optimized) ZIRLO™ alloy on eight lead test assemblies beginning with Catawba 1 Cycle 15. The NRC questions are bold type, followed immediately by the Duke response.

The staff uses several "conditions" that are contained in the final approved version of WCAP-15604-NP, Revision 1, "Limited Scope High Burnup Lead Test Assemblies," as guidance for its evaluation of the licensee's proposals. The issues that have not been addressed in Duke's submittal are listed below:

1. **WCAP-15604 states that the post-irradiation examinations of the fuel should consist of at least the following examinations: clad oxidation, rod and assembly growth, and visual examinations for pressurized water reactors.**

   Please provide a list of the proposed post-irradiation examinations for the lead test assemblies.

Catawba Response:

The proposed post-irradiation examination (PIE) scheduled for the Catawba lead test assemblies (LTAs) include visual examinations, fuel assembly length, fuel assembly bow, fuel assembly drag, fuel rod length, fuel rod wear, fuel rod profilometry, cladding oxidation, and grid cell measurements including dimensions and oxidation.

2. **WCAP-15604 states that for all fuel rods in the LTAs, the predicted oxidation should be less than 100 microns used on a best estimate basis with prediction of no blistering or spallation based on current data.**

   Please provide assurance that this limit will not be exceeded, and no blistering or spallation will occur.

Catawba Response:

The 100 micron limit will be met with no blistering or spallation. The existing licensed limits and methodology for current ZIRLO™ cladding will be used to analyze the fuel in Catawba. A separate Topical Report (WCAP-12610-P-A/CENPD-404-P-A, Addendum 1, "Optimized ZIRLO™", February 2003) was submitted by Westinghouse to the NRC for review and approval. The Catawba LTAs will contain the same Low Tin (Optimized) ZIRLO™ alloy as that described in this topical report. The topical contains sufficient detailed technical information to justify the use of Low Tin (Optimized) ZIRLO™. This topical was submitted to extend the licensed definition of ZIRLO™ and show that there would be no adverse impacts by its use.

3. WCAP-15604 describes two reports that the licensee will submit to the NRC for information.

The first report would be a notification of intent to irradiate LTAs above the current burn-up limit. It will contain at least the following information:

- **Utility Name**
- **Plant Name**
- **Cycle and date when the LTAs will be inserted**
- **Number of LTAs**
- **Location of the LTAs**
- **Anticipated pre- and post-cycle burnups for each LTA**
- **Purpose of LTAs**
- **Estimated dates for pre- and post-irradiation characterizations or the results of the pre-characterization and an estimation of the date for the post-irradiation characterization**
- **Estimated date of second report**
- **Statement that the LTAs will not be irradiated if:**
  - **the fuel does not meet all current design criteria, or**
  - **the predicted oxidation is not less than 100 microns, or**
  - **blistering or spallation is predicted, or**
  - **the pre-characterization examinations show anomalous results.**

The second report would present the results of the pre-and post-irradiation examinations. It will consist of at least the following information:

- **Utility Name**
- **Plant Name**
- **Assembly Identification Number**
- **Specific Measurements - Actual data and predictions**
- **Comment Section**

Please describe the reports that will be completed and submitted to the NRC and when the first report will be received by the NRC before irradiation of the lead test assemblies.

Catawba Response:

The Catawba LTA program contains several advanced fuel assembly features, including the Optimized ZIRLO™ fuel rods. The purpose of the overall program is to simultaneously irradiate a number of advanced fuel assembly features. The inclusion of Low Tin (Optimized) ZIRLO™ alloy fuel rods in the program is to further validate the information provided to the NRC in WCAP-12610-P-A/CENPD-404-P-A, Addendum 1. The Catawba LTA program will not irradiate the assemblies beyond the current licensed burnup limit. The LTAs will be designed and operated to ensure that current licensed limits for Catawba are complied with.

Therefore, since the LTAs at Catawba will not exceed the current licensed burnup limit, the subject reports described in WCAP-15604-NP, Revision 1, "Limited Scope High Burnup Lead Test Assemblies" are not going to be submitted. Reports currently required by the Catawba facility license and NRC regulations will continue to be sent as required to the Commission.